

NOTES ON NEOTROPICAL SPECIES OF *TETHINA* HALIDAY
(DIPTERA: TETHINIDAE)

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Abstract.—Neotropical beach-fly species (Diptera: Tethinidae) not included in a previous faunal revision of the Caribbean, Gulf of Mexico, and Bermuda are reviewed, including description of the following new species (type locality in parenthesis): *Tethina robusta* (Chile. Osorno: Puchatrihue). Two **new synonyms** are also proposed (junior synonyms cited first): *Rhinoessa sonorensis* Melander = *Tethina albula* Loew and *Tethina setulosa* Malloch = *Tethina spinulosa* Cole. A revised key to the Neotropical species of *Tethina* and a diagnosis for the senior synonyms are provided.

Key Words: Diptera, Tethinidae, *Tethina*, neotropics

Since revising the Tethinidae from the Caribbean, Gulf of Mexico, and Bermuda (Foster and Mathis 1998), we have studied additional Neotropical specimens that have revealed a striking new species from Chile and two synonyms of widespread species. This paper reports these discoveries. Herein, we present a revised key to the Neotropical species of *Tethina* and diagnoses for the species for which synonyms have been discovered. This paper is written within the context of our recent revision (Foster and Mathis 1998), and further details are found in that reference.

The discovery of the two new synonyms reported herein re-emphasizes our previous observation (Foster and Mathis 1998) that most coastal marine species of Tethinidae have widespread distributions. Although we studied most species of *Tethina* that were known to occur in the New World for our Caribbean study, we did not examine two species, *T. spinulosa* Cole and *T. sonorensis* (Melander), as both were reported to occur only in western North America and our

study concerned the Caribbean and adjacent areas. Our study of these two species reveals that they too are conspecific with other, widespread species as we document below.

Methods.—The descriptive terminology, with the exceptions noted in Mathis and Munari (1996), follows that of McAlpine (1981). We have followed the terminology for most structures of the male terminalia that other workers in Tethinidae have used (see references in Mathis and Munari 1996). The terminology for structures of the male terminalia is labeled on Figs. 2–4. The description of the new species is based primarily on its holotype.

States of Mexico are abbreviated as follows: Baja California Norte (BCN), Quintana Roo (QNR), Sonora (SON), and Tabasco (TAB).

KEY TO NEOTROPICAL SPECIES OF *TETHINA*

1. Gena high, at least 0.5 eye height 7
– Gena short, less than 0.5 eye height 2
2. Apex of scutellum with yellowish to reddish

- spot (may vary in size but always obvious) *T. xanthopoda* (Williston)
- Apex of scutellum uniformly gray microtomentose 3
- 3. Mid- and hindtibiae black on apical ½; first 3 tarsomeres white to pale yellow *T. albitarsa* Foster and Mathis
- Mid- and hindtibiae yellow; first 3 tarsomeres yellow 4
- 4. Hindfemur of ♂ not particularly swollen 5
- Hindfemur of ♂ distinctly swollen 6
- 5. Center of gena with elongate, shiny area apparently free of microtomentum (fig. 24 in Foster and Mathis 1998); surstylus armed with many short, well-developed, thick tooth-like setulae *T. texana* (Melander)
- Gena uniformly microtomentose (♂ unknown) *T. insulans* Curran
- 6. Surstylus curved anteriorly, ending in an acute point, densely setulose with well-developed setae over most of surface *T. cohiba* Foster and Mathis
- Surstylus paddle shaped, with well-developed setae along margin only *T. spinulosa* Cole
- 7. Body distinctly gray to grayish brown 8
- Body whitish 9
- 8. Tibiae yellow *T. willistoni* (Melander)
- Tibiae gray, microtomentose *T. robusta*, new species
- 9. Surstylus in lateral view curved anteriorly *T. albula* Loew
- Surstylus in lateral view straight 10
- 10. Surstylus in posterior view with median margin curved and rounded, sparsely setulose *T. lisae* Foster and Mathis
- Surstylus in posterior view with median margin straight, bearing dense row of setulae *T. bermudaensis* (Melander)

Tethina insulans Curran

Tethina insulans Curran 1932: 358.—Foster 1976b: 2 [Neotropical catalog].—Mathis and Munari 1996: 17 [world catalog].

Diagnosis.—Body length 3 mm, generally gray, microtomentose; setae and setulae black. Gena moderately high, slightly less than 0.5 eye height. Presutural acrostichal setae 4; scutellum uniformly gray, lacking a dorsal spot. Femora gray, microtomentose; hindfemur of male similar to or only slightly more swollen than fore- and mid-femora; tibiae yellow. Male terminalia unknown.

Distribution—*Neotropical*: Ecuador (Galápagos Islands).

Remarks.—We studied the apparent allotype female and only known specimen of *T. insulans*, which is deposited in the AMNH. The holotype male was originally deposited in the Zoological Museum, University of Oslo, Oslo, Norway [type locality: Ecuador. Galápagos Islands: Floreana, Post Office Bay (seaside)], and may now be lost.

Curran’s original description characterizes the allotype well and is not repeated here. The allotype, which is covered with white particles, is in poor condition (head partially collapsed, glue covering mouthparts, thorax very greasy, and abdomen is wrinkled and partially collapsed), making it difficult to study.

This species is apparently related to *T. milichioides*, as Curran noted in the original description (Curran 1932:359): “[This species] In Melander’s key to *Rhinoessa* (*Tethina*), traces to *milichioides* [sic] Melander but differs in having reddish antennae, etc.” *Tethina milichioides* is known from western United States (Mathis and Munari 1996). Although the setae are not as short as in *T. milichioides*, this species shares many of characters of the *milichioides* group (Foster 1976a). We are satisfied that *T. insulans* is not conspecific with any known Neotropical species.

Tethina albula (Loew)

(Figs. 8–10, 13 in Foster and Mathis 1998)

Rhinoessa albula Loew 1869: 44.—Malloch 1913: 147 [citation].—Melander 1913: 298 [key].—Hendel 1934:43 [key], 46 [citation].—Hennig 1937: 140 [citation].—Melander 1952: 202 [citation].

Tethina albula: Curran 1934: 330 [generic combination].—Vockeroth 1965: 727 [Nearctic catalog].—Prado and Tavares 1966: 431 [revision].—Foster 1976b: 2 [Neotropical catalog].—Mathis and Munari 1996: 14 [world catalog].—Foster and Mathis 1998: 609–611 [revision].

Rhinoessa sonorensis Melander 1952: 207.—Cole 1969: 387 [distribution, diagnosis].—Foster 1976b: 2 [lectotype designation]. **New synonym.**

Tethina sonorensis: Foster 1976b: 2 [generic combination, Neotropical catalog].

Diagnosis.—This species is distinguished from congeners by the following combination of characters: Body length 1.60–3.15 mm; body with gray to whitish gray microtomentum; setae generally white to mostly black (Guyana specimens); gena high, greater than 0.5 eye height; 4 irregular rows of acrostichal setulae; scutellum uniformly gray, lacking a spot; femora mostly yellow to mostly gray; hindfemora of male similar to or only slightly more swollen than fore- and midfemora; tibiae yellow; basal 4 tarsomeres yellow, apical tarsomere brown; surstylus articulated with and broadly attached to epandrium, narrowly spatulate in posterior view (Figs. 8, 10 in Foster and Mathis 1998), length 2.5× width, apex broadly rounded; median margin bearing irregular row of sparse setulae along entire length, setulae moderately well developed; surstylus in lateral view (Figs. 9–10 in Foster and Mathis 1998) narrow, height 3.5× width, gently curved anteriorly, basal portion produced anteriorly as a lateral lobe that bears a patch of setulae mesally; aedeagus thick, straplike, bearing dense velvety hairlike pubescence on dorsal surface.

Type material.—The syntype series, labeled “Loew Collection” and comprising one male (only two legs and a left wing remain) and four females (one bearing a red “Type” label (13444); MCZ), does not allow for accurate and reliable identification of this species. Osten Sacken, however, collected and retained a male (head missing) from the type locality (Newport, Rhode Island) when he collected the type series. Osten Sacken’s practice was to retain a few specimens of species represented by a long series, sending the majority to Loew for description. That retained,

headless male, which is presumably conspecific with the type series, was identified, dissected, and is the basis for our diagnosis of this species.

The lectotype male of *Rhinoessa sonorensis* (designated by Foster, 1976b:2) is labeled “SonoraMEXICO RockyP[oin]t Marsh 21 April '47 [1947] A.L. Melander/ALMelander Collection 1961 [stippled green band on right side of label]/Lectotype *Tethina sonorensis* (Melander) George A. RFoster 1974 [handwritten; black submarginal border].” The lectotype is double mounted (minuten in a rectangular card), is in excellent condition (abdomen removed and dissected, the structures in an attached microvial), and is deposited in the USNM.

Other specimens examined.—MEXICO. Sonora: Pt. Penasco, 21 Apr 1948, A. L. Melander (1 ♂, 3 ♀; USNM); Rocky Point Marsh, 21 Apr 1947, A. L. Melander (6 ♂, 10 ♀; USNM).

Distribution.—*Nearctic*: USA (DE, FL, MA, MD, NC, NY, SC, RI, VA). *Neotropical*: Bahamas, Belize, Guyana, Mexico (QNR, SON), Trinidad, Turks and Caicos, West Indies (Grand Cayman).

Remarks.—This is the first record of *T. albula* from the West Coast of the New World; we anticipate that it will be found to be more widespread.

Tethina spinulosa Cole

(Figs. 26, 28–29 in Foster and Mathis 1998)

Tethina spinulosa Cole 1923: 478.—Hendel 1934: 41 [citation].—Vockeroth 1965: 728 [Nearctic catalog].—Foster 1976b: 2 [Neotropical catalog].—Mathis and Munari 1996: 18 [world catalog].

Rhinoessa spinulosa: Melander 1952: 202, 208 [key, generic combination, citation].

Tethina setulosa Malloch 1934: 454.—Foster 1976b: 2 [Neotropical catalog].—Mathis and Munari 1996: 18 [world catalog].—Foster and Mathis 1998: 624 [revision]. **New synonym.**

Rhinoessa setulosa: Hennig 1937: 139 [generic combination, citation].

Diagnosis.—This species is distinguished from congeners by the following combination of characters: Body length 1.85–2.70 mm; body generally with gray microtomentum; setae generally black; gena short, less than 0.5 eye height; 4 somewhat irregular rows of acrostichal setulae; scutellum uniformly gray, lacking apical spot; femora mostly gray; hindfemora of male distinctly swollen, distinctly larger than fore- and midfemora; tibiae and basal 4 tarsomeres yellow, apical tarsomere brown; surstylus articulated with and broadly attached to epandrium, broadly spatulate in posterior view (Fig. 29 in Foster and Mathis 1998), length about equal to width, median margin bearing dense patch of robust setulae along entire length (Fig. 29 in Foster and Mathis 1998); surstylus in lateroblique view (Fig. 28 in Foster and Mathis 1998) broadly rounded, constricted anteriorly, external surface bearing numerous setulae; aedeagus thin, ribbonlike.

Type material.—The holotype male of *Tethina spinulosa* is labeled “[MEXICO. Baja California Norte:] Las Animas Bay[,] Gulf Cal. May 8 1921/EPVan Duzee Collector/HOLOTYPE spinulosa/ALLOTYPE spinulosa/Tethina spinulosa Type and allotype [two specimens on separate points; type data taken from Arnaud 1979:345].” The holotype and allotype are double mounted (glued to separate paper points on same pin) and are deposited in the CAS (1356). We examined 30 paratypes, including 18 from the type locality, as follows: Mexico. Baja California Norte: Las Animas Bay, 8 May 1921, E. P. Van Duzee (4 ♂, 14 ♀; USNM); Loreto, 19 May 1921, E. P. Van Duzee (8 ♂, 4 ♀; USNM).

The holotype male of *Tethina setulosa* is labeled “Angol [crossed out] Chile DSBullock/Tocopilla [Antofagasta] Ap. 10, [19]31 Sea Beach [handwritten]/Type No. 50448 U.S.N.M. [red; “50448” handwritten]/Tethina setulosa Type Det. JRMALLOCH [spe-

cies name and “Type” handwritten; black submargin].” The holotype is directly pinned, is in good condition (abdomen removed and dissected, the parts are in an attached microvial), and is deposited in the USNM (50448).

Other specimens examined.—ECUADOR. Galápagos: Isla Santa Cruz: Academy Bay, Darwin Research Station (beach and coastal rocks), 24 Jan 1964, D. Q. Cavanaugh, R. O. Schuster (7 ♂, 6 ♀; USNM).

MEXICO. Sonora: Guaymas (40 mi N), 24 Nov 1951, J. J. Teas (3 ♂, 4 ♀; USNM); Pto. de Lobos, 18–19 Mar 1974, W. Brown, V. Roth (5 ♂, 3 ♀; USNM); “Marsh,” 21 Apr 1947, A. L. Melander (1 ♂; USNM).

UNITED STATES. California. Orange: Balboa, 13 Jul 1940 (2 ♂; USNM); Corona del Mar, 25 Jul–19 Nov, 1942–1949, A. L. Melander (5 ♂, 9 ♀; USNM); Doheny Park, 12 Oct 1951, A. L. Melander (3 ♂, 7 ♀; USNM); Laguna Beach, 18 Jul–12–20 Oct 1943, 1951, A. L. Melander (15 ♂, 9 ♀; USNM); San Clemente, 13 Oct 1950, A. L. Melander (3 ♂, 4 ♀; USNM); Seal Beach, 26 Jul 1942, A. L. Melander (2 ♂, 1 ♀; USNM). Los Angeles: Palos Verdes, 15 Oct 1944, A. L. Melander (4 ♂, 7 ♀; USNM). San Diego: Scripps, 8 Oct 1972, L. Chang (4 ♂, 2 ♀; USNM).

Clipperton Island (10°17'N, 109°13'W; a French possession off the Pacific Coast of Mexico), 22 Aug 1958, C. F. Harbison (15 ♂, 6 ♀; USNM).

Distribution.—Widespread, primarily on the west coast of the New World. *Nearctic*: United States (CA). *Neotropical*: Chile (Tarapaea to Antofagasta), Clipperton Island, Ecuador (Galápagos), Mexico (BCN, SON, TAB).

Remarks.—Although this species was known previously from Chile (Malloch 1934) and later from the Caribbean coast of Mexico (TAB; Foster and Mathis 1998), we have identified numerous other specimens from the West Coast of the New World as noted above. The specimens from Clipperton Island, a French possession in the north

Pacific, approximately 1,100 km from the west coast of Mexico, are of note.

Tethina robusta Foster and Mathis,
new species
(Figs. 1–4)

Diagnosis.—This species is distinguished from congeners by the following combination of characters: Body with gray microtomentum, thorax entirely gray; setae black; gena high, 0.62–0.75 eye height; 4 irregular rows of acrostichal setulae; scutellum uniformly gray, lacking yellowish to reddish spot; femora distinctly gray; fore- and hindfemora of male distinctly swollen, distinctly larger than midfemora, with hindfemora distinctly larger than forefemora; tibiae black; basal 3 tarsomeres yellow, appearing velvety ventrally on fore- and hindleg; surstylus broadly spatulate and broadly attached to epandrium posteriorly, bearing 2 rows of short setae along medial margin and scattered setae on posterior surface; epandrium with a large, triangular, ventral lobe nearly as long as surstylus, sparsely setulose on medial surface, bearing a row of short setae along posterior margin; aedeagus very thin, ribbonlike.

Description.—Body length 2.65–2.85 mm; body with gray microtomentum; setae black.

Head (Fig. 1): Setae black. Vertex gray, microtomentose; ocellar tubercle bearing 2 ocellar setae and 1 shorter setula directly in middle; postocellar seta well developed; frons yellowish medially, grayish laterally, microtomentose; interfrontal setae 3, anterior pair proclinate, posterior 2 setae convergent; fronto-orbital setae as 3 convergent, proclinate inner setae and 4 divergent, outer setae; bearing 2 additional pairs of dorsally directed setae near base of antennae. Antenna dark brown except basal ½ of 1st flagellomere reddish brown; arista dark brown, sparsely pubescent. Face white microtomentose; facial tubercle yellow, dorsal of anteriormost seta; peristomal setae bearing 4 dorsally directed setae, 5th di-

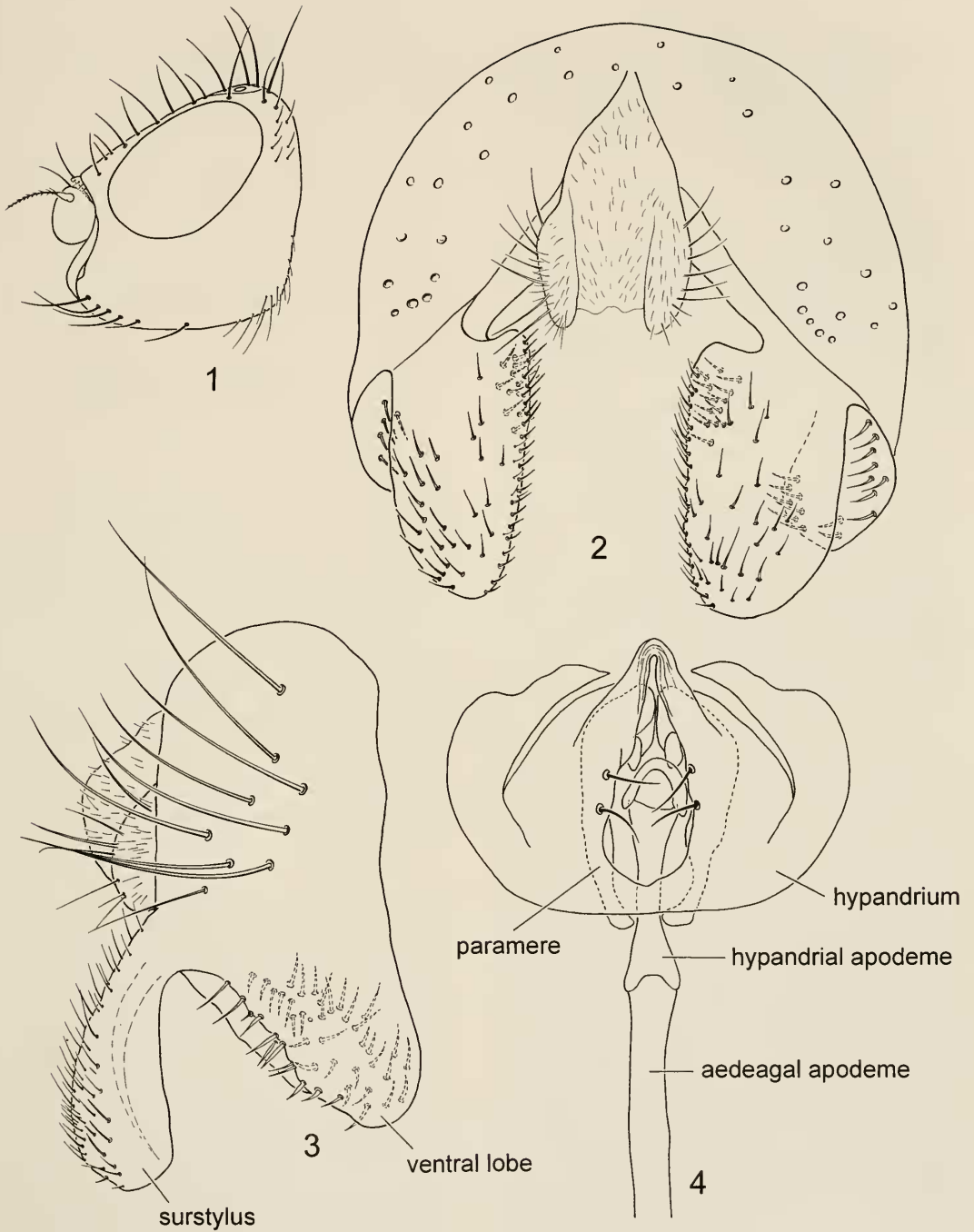
rectly anteriorly. Gena high, 0.62–0.75 eye height, white, microtomentose; postgena gray bearing pale setulae. Palpus yellow; labellum long, brown.

Thorax: Entirely gray microtomentose; scutellum uniformly gray, lacking yellowish to reddish spot. Acrostichal setulae in 4 irregular rows; dorsocentral setae 5 (2+3); proepisternum and proepimeron each bearing 1 seta. Wing with veins brown to yellow except center of crossveins distinctly whitish; costa continuing strongly to vein M; vein R_{2+3} and R_{4+5} divergent; veins R_{4+5} and M parallel apically. Midtibia ventrally bearing several strong black setae in addition to long apical seta; hindtibia bearing 1 well-developed seta in addition to apical seta; coxae gray to brownish gray, bearing mostly pale setulae; femora entirely gray microtomentose, swollen, especially hindfemur, which is distinctly more swollen than fore- and midfemora; tibiae gray microtomentose; basal 3 tarsomeres yellow, apical tarsomeres black.

Abdomen: Setae and setulae black; distal margins of segments yellow, remainder concolorous with thorax. Male terminalia (Figs. 2–4): Surstylus broadly spatulate and broadly attached to epandrium posteriorly, bearing 2 rows of short setae along medial margin and scattered setae on posterior surface; epandrium with a large, triangular, ventral lobe nearly as long as surstylus, sparsely setulose on medial surface, bearing a row of short setae along posterior margin; aedeagus very thin, ribbonlike.

Type material.—The holotype ♂ is labeled “CHILE: Osorno Pr[ovince]: Pucatrihue, 27–30 January 1978 WNMathis/HOLOTYPE *Tethina robusta* ♂ Foster & W.N.Mathis USNM [red; species name and “♂ & Foster” handwritten].” The holotype is double mounted (minuten in a block of plastic), is in excellent condition (a few setae with apices broken), and is deposited in the USNM. Three paratypes, all males, bear the same locality label data as the holotype.

Distribution.—*Neotropical:* Chile. Osorno: Pucatrihue.



Figs. 1–4. *Tethina robusta*: 1, Head, lateral view. 2, External male terminalia, posterior view (Chile, Orsono: Puchatrihue). 3, Same, lateral view. 4, Internal structures of male terminalia (aedeagus excluded), ventral view.

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